

PATENT SPECIFICATION

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(54) HEAT-INSULATING PLASTICS CONTAINER ASSEMBLY

(71) We, HOECHST AKTIENGESSELLSCHAFT, a body corporate organised according to the laws of the Federal Republic of Germany, of 6230 Frankfurt/Main 80 Federal Republic of Germany, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a two-piece container and lid assembly consisting of a two-layer plastics open-topped container with a lid covering its opening.

15 The present invention provides a heat-insulating container and lid assembly comprising a container as (hereinafter defined) of a laminate of a pore-free thermoplastics layer and a cellular thermoplastics layer, and a lid of a laminate of a cellular thermoplastics layer and a pore-free thermoplastics layer, the lid being bonded to the surface of the brim of the container.

25 The term "container", as used herein, means a hollow body consisting of a bottom and a side wall or walls rising from it to an upper brim which forms and surrounds the opening of the container.

30 The opening of the container is closed by a lid consisting of a multi-layer flat laminate which is composed of at least one layer of thermoplastics material having a foam structure and of a pore-free layer of thermoplastics material. The upper surface of the brim of the container opening is bonded to the lower surface of the lid.

35 The sufficiently rigid layer of the container having a foam structure advantageously comprises polystyrene, and the pore-free layer advantageously comprises a pore-free polystyrene film.

45 The lid consists of a multi-layer plastics laminate, a first layer advantageously being composed of a pore-free thermoplastics film and a second layer of a rigid plastics foam.

If necessary, a third layer may be arranged between the first and the second layers in the form of a film which is, compared with the first one, thin and non-self-supporting and which causes the two above-mentioned 50 layers to stick together.

In the lid, the layer of pore-free film preferably consists of an oriented polyester film, for example, polyethylene terephthalate film, and the layer having a foam 55 structure preferably consists of polystyrene. In this embodiment a third layer in the form of a non-self-supporting adhesive film, advantageously of a film based on polyurethane, is preferably arranged between these 60 two layers.

At the opening of the container the wall preferably has a flange-like brim projecting over the edge of it to the outside and surrounding the opening. 65

The size of the lid is preferably such that it covers the opening of the container as well as the surface of the flange-like brim.

A particularly preferred container comprises a bowl which consists of a layer of foam polystyrene having a weight in the range of 150 to 250 g per metre³ and a thickness between 3 and 6 mm and a pore-free polystyrene film having a thickness of 75 between 150 and 250 μ .

The lid of the preferred container consists of a layer of foam polystyrene of a thickness between 3 and 4 mm and of a pore-free oriented film of polyethylene terephthalate having a thickness in the range 80 of 8 to 20 μ , preferably 12 μ , and an adhesive film composed of polyurethane which is, compared with the pore-free film, thin and is arranged between these two layers. A particularly preferred version of this container consists of a bowl having a flange-like brim around its opening, the inner and upper surfaces of which brim consist of a pore-free film made of polystyrene having 85 a good impact strength while the outside of 90

the bowl and the lower surface of the flange-like brim are composed of a layer of polystyrene having a foam structure. The lid of the preferred container consists of a polystyrene layer having a cellular structure, of a pore-free oriented polyester film and a thin and non-self-supporting adhesive film of polyurethane which is arranged between the two films. The lid is preferably bonded to the bowl in such a manner that the film having a cellular structure is of a chemically similar material to the upper layer of the opening brim of the bowl. The latter layer is bonded with the cellular layer of the lid, advantageously by means of welding. The term 'bonding' includes, for example, heat sealing and welding.

The bowl and the lid of the container according to the invention may have good thermal insulating properties, and the connection between the lid and the brim of the bowl may be sufficiently firm on the one hand but on the other hand be sufficiently easy to remove the lid from the flange-like brim of the bowl without tearing the foam layer of the lid. Goods inside the container can be warmed up in it by exposing the container to the effect of microwaves, preferably in a microwave oven. The accompanying drawing, which shows the cross-section of a container, further explains the invention, the wall thicknesses of layers being exaggerated.

The container consists of a laminate of a polystyrene layer 1 having a foam structure and of a pore-free film of polystyrene 2. The lid covering the opening of the bowl is a laminate consisting of a polystyrene layer 11 having a foam structure and a pore-free film of an oriented polyester 4, an adhesive film 3 of polyurethane being arranged between the two films. The lid lies on the upper surface of the brim and is connected with it by means of bonding.

A container constructed according to the invention may have the advantage that its lid has a heat-insulating effect on the one hand but is largely resistant against mechanical damage on the other hand.

The container is produced, for example, by forming the bowl of a flat plastics laminate consisting of a cellular layer of thermoplastics material, for example a layer of polystyrene foam, and a pore-free film of thermoplastic material, for example a polystyrene film having a good impact strength, in the known manner during heating and by means of apparatus customary for this purpose. A multi-layer film having the above-mentioned structure is chosen as the lid, for example a foam polystyrene layer an oriented polyester film and a polyurethane film arranged between them.

WHAT WE CLAIM IS:—

1. A heat-insulating container and lid-

assembly comprising a container (as hereinbefore defined) of a laminate of a pore-free thermoplastics layer and a cellular thermoplastics layer, and a lid of a laminate of a cellular thermoplastics layer and a pore-free thermoplastics layer the lid being bonded to the surface of the brim of the container.

2. An assembly as claimed in claim 1, wherein the container laminate is of a foam polystyrene layer and a pore-free polystyrene film.

3. An assembly as claimed in claim 2, wherein the foam polystyrene has a weight in the range of 150 to 250 g/metre².

4. An assembly as claimed in claim 2 or claim 3, wherein the pore-free polystyrene film has a thickness between 150 and 250 μ .

5. An assembly as claimed in any one of claims 1 to 4, wherein the lid laminate has an adhesive film between the cellular layer and the pore-free layer.

6. An assembly as claimed in claim 5, wherein the lid laminate comprises a foam polystyrene layer, a polyurethane adhesive film and a pore-free polyester film.

7. An assembly as claimed in claim 6, wherein the polyester film is oriented.

8. An assembly as claimed in claim 7, wherein the oriented film is a polyethylene terephthalate film.

9. An assembly as claimed in any one of claims 1 to 8, wherein the cellular layer of the lid has a thickness between 3 and 4 mm.

10. An assembly as claimed in any one of claims 1 to 9, wherein the pore-free layer of the lid has a thickness between 8 and 20 μ .

11. An assembly as claimed in any one of claims 1 to 10, wherein the container brim comprises an outwardly projecting flange, to the upper surface of which the lid is bonded.

12. An assembly as claimed in any one of claims 1 to 11, wherein the inner surface of the container laminate is the pore-free layer.

13. An assembly as claimed in claims 11 and 12, wherein the upper surface of the flange is the pore-free layer.

14. An assembly as claimed in any one of claims 1 to 13, wherein the surface of the lid to which the container is bonded is the cellular layer.

15. An assembly as claimed in any one of claims 2 to 14, wherein the foam polystyrene layer of the container has a thickness between 3 and 6 mm.

16. A container and lid assembly, substantially as hereinbefore described with reference to and as illustrated by the accompanying drawing.

17. An assembly as claimed in claim 1, wherein the inner surface of the container and the upper surface of the brim of its

opening consist of a pore-free polystyrene layer and the outer surface of the container and the lower surface of the brim of its opening consist of foam polystyrene, the lid
5 consists of a foam polystyrene layer and an polyester layer with a polyurethane layer positioned between them, and the lid and the container are so arranged that the layer of the lid having a foam structure touches
10 the upper surface of the brim of the open-

ing of the container and is firmly connected with it by means of welding.

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COMPLETE SPECIFICATION

1 SHEET

*This drawing is a reproduction of
the Original on a reduced scale*

